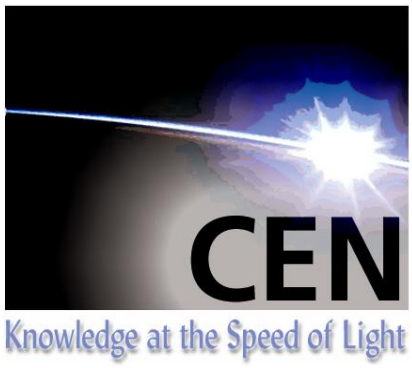

CEN Connections
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Connecticut Leading the Way in High Speed Networking

Around the nation and world, leading-edge consortiums are working to build and link networks capable of delivering – at the speed of light – high tech tools for educators.

Connecticut is at the forefront of the effort.

By 2005, the nation's first all-optical K-20 network – the Connecticut Education Network - will be complete, helping educators open new doors for students everywhere.

This effort began with a vision and directive in 2000 from the state's top government and education leaders, led by Lt. Governor M. Jodi Rell, to create a state of the art network and technology environment for students.

The Department of Information Technology (DOIT) was charged with developing the Connecticut Education Network.

Today - less than four years later – the network is now more than 40 percent complete.

It extends to almost half of the state's K-12 and higher education students, and 13 library systems.

This first edition of *CEN Connections* will highlight network progress and impact. Future editions will highlight ways the network is enhancing the classroom environment.

Teachers and technology administrators are encouraged to send comments and suggestions on how this forum can be of use to you as we develop new ways of using the network now and in the future.

What Does a CEN Connection Mean?

✓ Low to No Cost Access to the Internet
✓ Dramatic Increase in Speed and Access
✓ Ability to Use Mega-Bandwidth Multimedia Applications
✓ Access to Internet 2 Educational Resources

And Much More!

Connecticut's journey is just beginning.
Read more inside about the instant benefits, and limitless potential, of CEN!

CEN: The Nation's First K-20 All-Optical Network

When completed, CEN will be the nation's first all-optical K-20 network.

In this kind of network, information travels in the form of light, moving at breathtaking speed through hundreds of miles of glass fiber.

To state schools and students, it means they have access to a network that is fast, and capable of carrying the load of complex, multi-media classroom technology applications, available now and being developed for the future.

It means access to a network that can help teachers turn classroom field trips into expeditions – cross-town or trans-continent.

CEN is a network that brings brilliant fidelity and fosters collaboration - where one teacher's innovative lesson plans and ideas can be shared with teachers in other schools in an instant.

It means the ability to reliably and securely bring remote teachers and outside experts in to every Connecticut classroom

And it brings endless possibilities, including sharing obscure learning resources including languages, sciences, mathematics seamlessly across the State.

CEN Link to Abilene Network Means Access to Leading Edge Tools

Thanks to the sponsorship of Yale University and the University of Connecticut, the Connecticut Education Network connected to the Abilene Network in 2003.

Abilene is a leading edge, research and education network developed by Internet2, a national consortium of 204 universities working with industry and government on advanced network applications and technologies.

By being named a Sponsored Education Group Participant (SEGP), the Connecticut Education Network joins an elite group of K-12 network systems also invited to connect to Abilene.

As a result, all CEN members now have high-speed access to the non-commercial capabilities of Internet2.

The Abilene Network supports the development of applications such as virtual laboratories, digital libraries, distance education and tele-immersion, as well as the advanced networking capabilities that are the focus of Internet2.

Connecticut's CEN network is one of only a small handful of State Networks truly capable of delivering Internet2 capabilities to every school district and campus in the State.

Whereas almost every state except Connecticut has network bottlenecks between their Internet2 connections and each school district, CEN's optical architecture actually extends research-university grade networking all the way to each school district.

The CEN Advantage

No Cost (K-12), Low Cost (Colleges and Universities) Internet Access

The CEN connection service is provided free to K-12 schools and libraries.

Schools connected to CEN are saving significant sums on internet service and connection fees.

Colleges and Universities – the powerhouse users of the internet - have realized savings as well, paying far less that would have been required with a commercial internet access service provider. Through Internet2 CEN is also giving higher education faculty access to a cutting edge resource.

Immediate Increase in Capacity

Too many users and not enough bandwidth can slow a network down, keeping teachers and students off the internet.

Getting connected to CEN changes that – instantly.

The Wallingford School District used to use a "T-1 line" to access the internet.

But as traffic increased on the T-1 line, response time slowed. That soon changed when the district connected to the CEN, according to Technology Director Paul Picard.

Today, this school district has more than 2000 computers on their network and at any given time more than 500 users are using the internet.

Across District Lines

Opportunities for sharing curriculum, lesson plans, and learning resources including languages, sciences, and mathematics now exist seamlessly across the State. These and other cooperative efforts are a few of the exciting possible uses of CEN.

The Wethersfield school system, for example, reports that programs have taken place "*between districts in Connecticut, throughout the US, in Puerto Rico and in Greece,"* according to Louisa Graver, Technology Coordinator for the Wethersfield Public School System.

"At a recent conference, students were calling family (using video links) from all over the campus over our IP connection and our regular Internet services did not suffer at all."

- Karen Warren, American School for the Deaf

Ability to Use New Video and Multimedia Based Learning Tools

A high bandwidth connection expands the applications teachers and students can use.

The American School for the Deaf in West Hartford, for example, has used videoconferencing since 1999. But prior to getting linked to the CEN, videoconferencing was costly and slow.

CEN changed that, the school reports.

"*With CEN, our world has opened up exponentially,"* writes Karen Warren of ASD.

The school now has the capacity for new video relay services, which allows a deaf person to call a hearing person using a video relay interpreter.

And because of CEN, doing so did not slow down the rest of the campus internet services.

CEN: Many Uses, Endless Possibilities

Developing new tools themselves – from videoconferencing to interactive multi-media virtual learning experiences – is one of today's most exciting and dynamic areas of advancement.

Even before the network is completed, CEN is making an impact.
Read on for examples … from Black Sea to Danbury.

The Black Sea Expedition

Dr. Robert Ballard's fifth expedition to the Black Sea in the summer of 2003 - to excavate an underwater wreck found the previous year – was seen live by the public, thousands of miles away, thanks to a connection that CEN – with its access to Internet2 - provided to the Mystic Aquarium Institute for Exploration under the sponsorship of the University of Connecticut.

The connection brought Internet2 access to the Institute and allowed live video of the mission to be available on the internet to the public.

CEN and Monterey Bay, California

A new program at the Mystic Aquarium enables participants to remotely control robotic undersea vehicles in the Monterey Bay Kelp Forest in Monterey, California.

The technology enabling this live access and interaction is the Abilene Internet2 high-speed backbone network, access to which was provided by CEN and the University of Connecticut to the aquarium.

Connecticut schools connected to the CEN began access to a live web feed of the Monterrey National Marine Sanctuary beginning in August, 2002.

Over the next two years, twenty more additional marine sanctuaries will become available in Connecticut through CEN.

Carlos Vas on Danbury Schools Use of CEN

"Elementary schools now have over 150 classroom web sites that we use to guide kids to specific curriculum sites to better integrate the Internet into classroom learning.

We use email with parents to better communicate about their children. We update school web sites monthly to better our parent communication about school events.

(We) use Elem Great Links page to share integrated technology lessons with staff. (We use) staff email to publicize and register for technology workshops."

- Carlos Vas
Director, Technology Services
Danbury Public Schools

Dr. Ballard on Use of Internet to Broadcast Expedition

"*We also, for the first time ever, connected to other scientists and researchers (as well as the public) by wiring our mission live via satellite and Internet technology…."*

"This level of connectivity will advance the pace of scientific discovery exponentially. In the same way, this live mission broadcast has turned the expedition into an educational experience. Children all over the world will be able to follow the mission as it's happening."

- Dr. Robert Ballard
Chief Information Officer Magazine,
Fall/Winter 2003